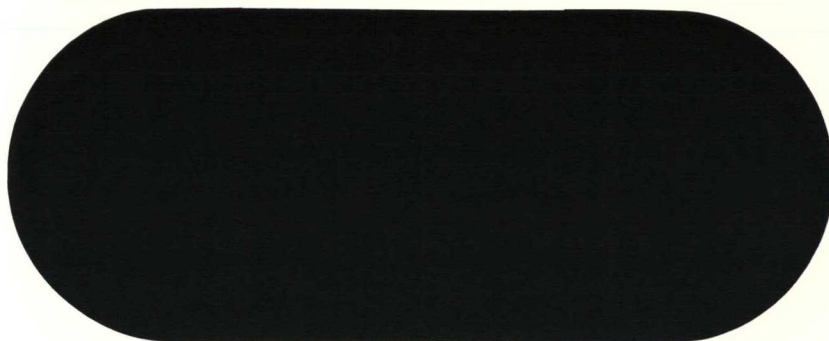




Port of Seattle Submittal WA 2917
For RFA 6-26-92 9-24-91
79

Converse Consultants NW

Geotechnical Engineering
and Applied Earth Sciences



FILE COPY

USEPA RCRA



3012568



18 West Mercer
Suite 300
Seattle, Washington 98119
(206) 285-5200 TEL
(206) 285-6231 FAX

NOTA PETIT
ADMINISTRATIVE RECORD
ITEM NO. 31
TOTAL NUMBER OF PAGES

FILE COPY

WA 2917
SITE INVESTIGATION AND REMEDIAL CLEANUP ACTION

Bunker "C" Fuel Oil Line Break

Pacific Northern Oil - Pier 91

Seattle, Washington

9/24/1991

Prepared for:

Pacific Northern Oil

Converse Project No. 91-35290-01

September 24, 1991





18 West Mercer
Suite 300
Seattle, Washington 98119
(206) 285-5200 TEL
(206) 285-6231 FAX

September 24, 1991

91-35290-01

Pacific Northern Oil
100 West Harrison Plaza
Seattle, Washington 98119

Attention: Mr. George Markwood

Subject: **SITE INVESTIGATION AND REMEDIAL CLEANUP ACTION**
Bunker "C" Fuel Oil Line Break
Pacific Northern Oil - Pier 91
Seattle, Washington

Enclosed is our report on the remediation of the recent Pier 91 bunker "C" fuel oil line break. Approximately 20 cubic yards of petroleum-contaminated soil resulting from the line break were removed and transported to Woodworth & Company in Tacoma for use in hot asphalt batch mix. Total depth of the excavation was 6 feet below ground surface. Groundwater was not encountered. Confirmation soil samples obtained from the sidewalls and bottom of the excavation indicated total petroleum hydrocarbon (TPH) concentrations below the current 200 parts per million (ppm) cleanup standard as established under the Model Toxics Control Act (WAC 173-340). It is our opinion that this site meets the criteria for clean closure.

We have enjoyed performing this work for you. If you have any questions, please feel free to give us a call.

CONVERSE CONSULTANTS NW

Richard A. Larson
Geologist

Erick W. Miller *by Jm*
Project Hydrogeologist

RAL/EWM/kpp



INTRODUCTION

This report presents field observations and results of remedial cleanup actions performed at the recent Pier 91 bunker "C" fuel oil line break. On May 14, 1991, Pacific Northern Oil (PNO) discovered a rupture in a bunker "C" transfer line buried approximately 4 feet below grade located near the south end of Pier 91, located in Elliott Bay, Seattle, Washington. Upon discovery, the line was closed and isolated from the fuel transfer system. A generalized project location map is presented on Figure 1. Figure 2 presents a detailed site plan.

PNO representatives estimate that approximately 30 to 60 gallons of fluid escaped the line prior to it being shut in. PNO immediately contacted and authorized Converse Consultants NW (Converse) to perform the cleanup and remediation of petroleum-contaminated soils resulting from the ruptured transfer line. Due to a miscommunication between Converse and PNO, the line break was not reported to the Washington State Department of Ecology (Ecology) until June 12, 1991. Ecology assigned the line break the case number 4903.

REMEDIAL CLEANUP ACTIONS

Soil Excavation and Compliance Sampling

During the initial excavation from May 15 to 17, 1991, approximately 10 cubic yards of petroleum-contaminated soil were removed from around the ruptured line and stockpiled near the excavation. The stockpiled soil was placed on and covered with plastic sheeting. On June 2, 1991, following the replacement of the ruptured section of the transfer line, Converse visited the excavation and made recommendations based on visual observations and field screening for additional excavation of soils in areas exhibiting signs of petroleum contamination. An additional 7 to 10 cubic yards of soil was excavated from the area on June 5-9, 1991.

Confirmation soil samples were obtained from the excavation sidewalls and bottom on June 14, 1991. Confirmation sampling consisted of five soil samples collected from within the excavation pit. One sample was collected from each sidewall and the bottom of the excavation and submitted for total petroleum hydrocarbons (TPH)

analysis by EPA 418.1. Analytical testing detected the presence of petroleum hydrocarbon compounds in the excavation base sample (CS-5) at concentrations (300 parts per million) exceeding the clean-up standards for TPH as established in Model Toxics Control Act (MTCA) (WAC 173-340-740). Based on the analytical testing results, an additional 5 cubic yards of soil were removed from the bottom of the excavation. Following the additional excavation, soil samples were collected from four locations in the re-excavated area and submitted for analysis as a composite sample (CS-6). TPH was not detected in concentrations above the detection limit utilized (10 parts per million).

Sampling locations are presented in Figure 3. Confirmation soil samples collected from within the excavation were obtained with a hand spatula. All sampling equipment was decontaminated between each sample utilizing a Liquinox wash, a potable water rinse, methanol rinse and finally a distilled water rinse. Individual samples were placed in laboratory-decontaminated jars for delivery to the analytical laboratory. Samples were hand-delivered to North Creek Analytical in Bothell and Analytical Resources, Inc. in Seattle following EPA chain-of-custody protocol. Samples were analyzed for total petroleum hydrocarbons (TPH) by EPA method 418.1.

SUBSURFACE CONDITIONS

Soil types encountered during the excavation consisted of brown, fine to medium grained, silty sand fill with gravel and shell fragments extending from the surface to the base of the excavation (6 feet below grade).

ANALYTICAL RESULTS

Samples CS-1 through CS-4

Analytical testing of the four sidewall samples detected TPH in samples CS-2 and CS-3 at concentrations of 22 parts per million (ppm) and 31 ppm, respectively. TPH compounds were not detected at sample locations CS-1 and CS-4 above the detection limits utilized.

Samples CS-5 and CS-6

Total petroleum hydrocarbons were detected in the base of the excavation (CS-5) at a concentration of 300 ppm. Following additional soil removal from the bottom of the excavation, samples were collected from four bottom locations and submitted as a composite sample (CS-6). TPH was not detected in sample CS-6 above the detection limit utilized.

Analytical results are summarized in Table 1. Laboratory analytical results and chain-of-custody documentation are presented in Appendix A.

PETROLEUM-CONTAMINATED SOILS TREATMENT AND DISPOSAL

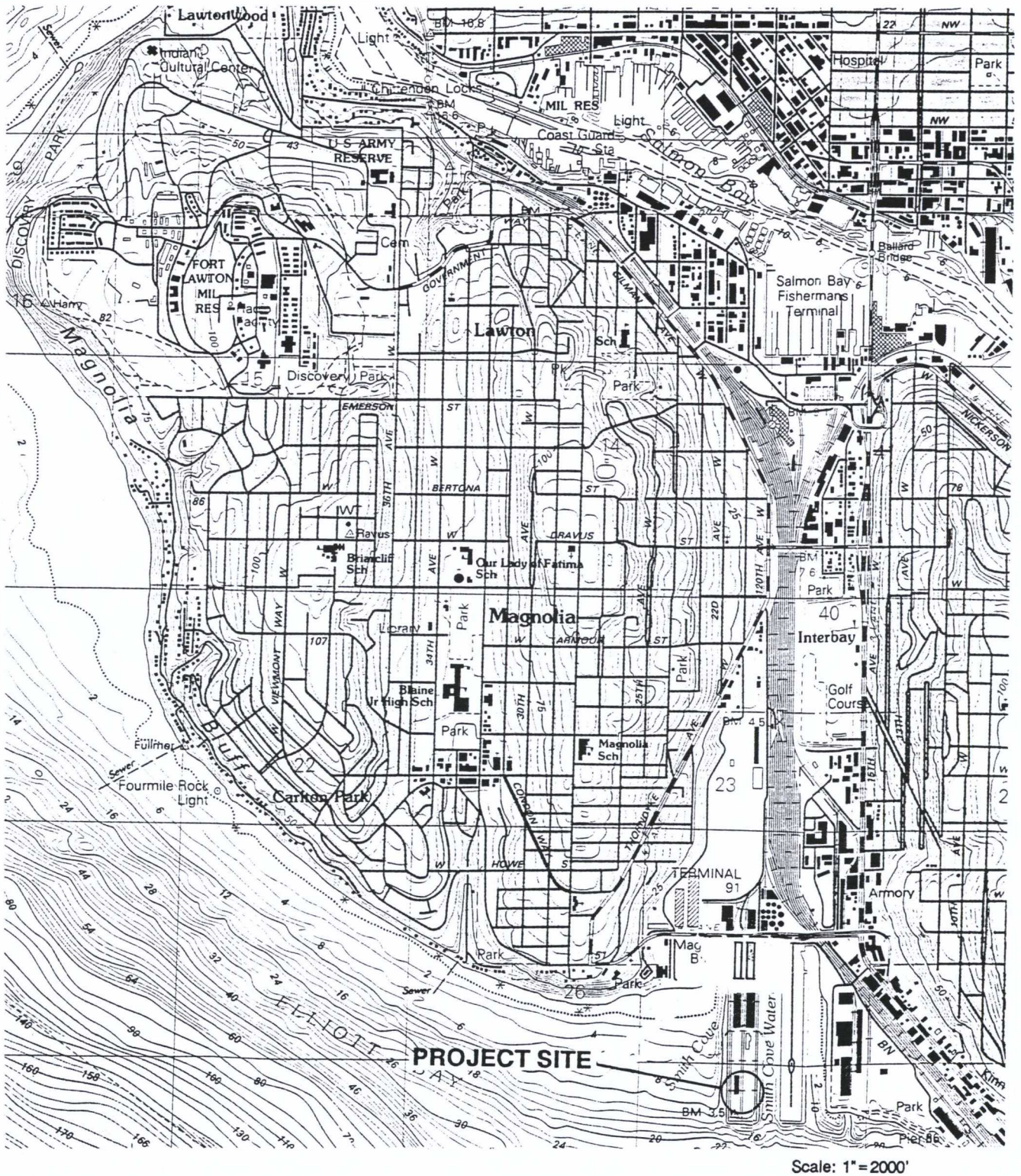
Soils containing TPH compounds as a result of the pipeline break were excavated and transported to the Woodworth & Company asphalt plant located in Tacoma, WA. Decontamination and disposal of the petroleum-contaminated soils was achieved through heat processing and asphalt fixation. Soil disposal manifest and weight vouchers are presented in Appendix B.

CONCLUSIONS

Confirmation soils samples obtained from locations within the excavation did not detect TPH compounds in the sidewalls in concentrations exceeding the cleanup standards established in the Model Toxics Control Act. TPH was detected in the excavation base sample at a concentration of 300 ppm. Approximately 5 cubic yards of additional soil was excavated from the base of the excavation and a composite sample was collected. TPH was not detected in a composite sample from the re-excavated area above the detection limit utilized (10 ppm). The pipeline was repaired by PNO personnel and the excavation was backfilled with class "A" pit run on June 26, 1991.

TABLE 1
ANALYTICAL RESULTS-SOILS
Pier 91 Bunker "C" Fuel Oil Line Break

<u>Sample Number</u>	<u>Sample Location</u>	<u>Total Petroleum Hydrocarbons mg/kg (ppm)</u>
CS-1	Sidewall	N.D.
CS-2	Sidewall	22
CS-3	Sidewall	31
CS-4	Sidewall	N.D.
CS-5	Bottom, depth-5 feet	300
CS-6	Bottom, depth-6 feet	N.D.
Cleanup Standards for TPH other than gasoline as established in the Washington Department of Ecology Model Toxics Control Act (July, 1990)		200



PROJECT LOCATION MAP

BUNKER C OIL LINE BREAK - TERMINAL 91
Seattle, Washington
for Pacific Northern Oil Company

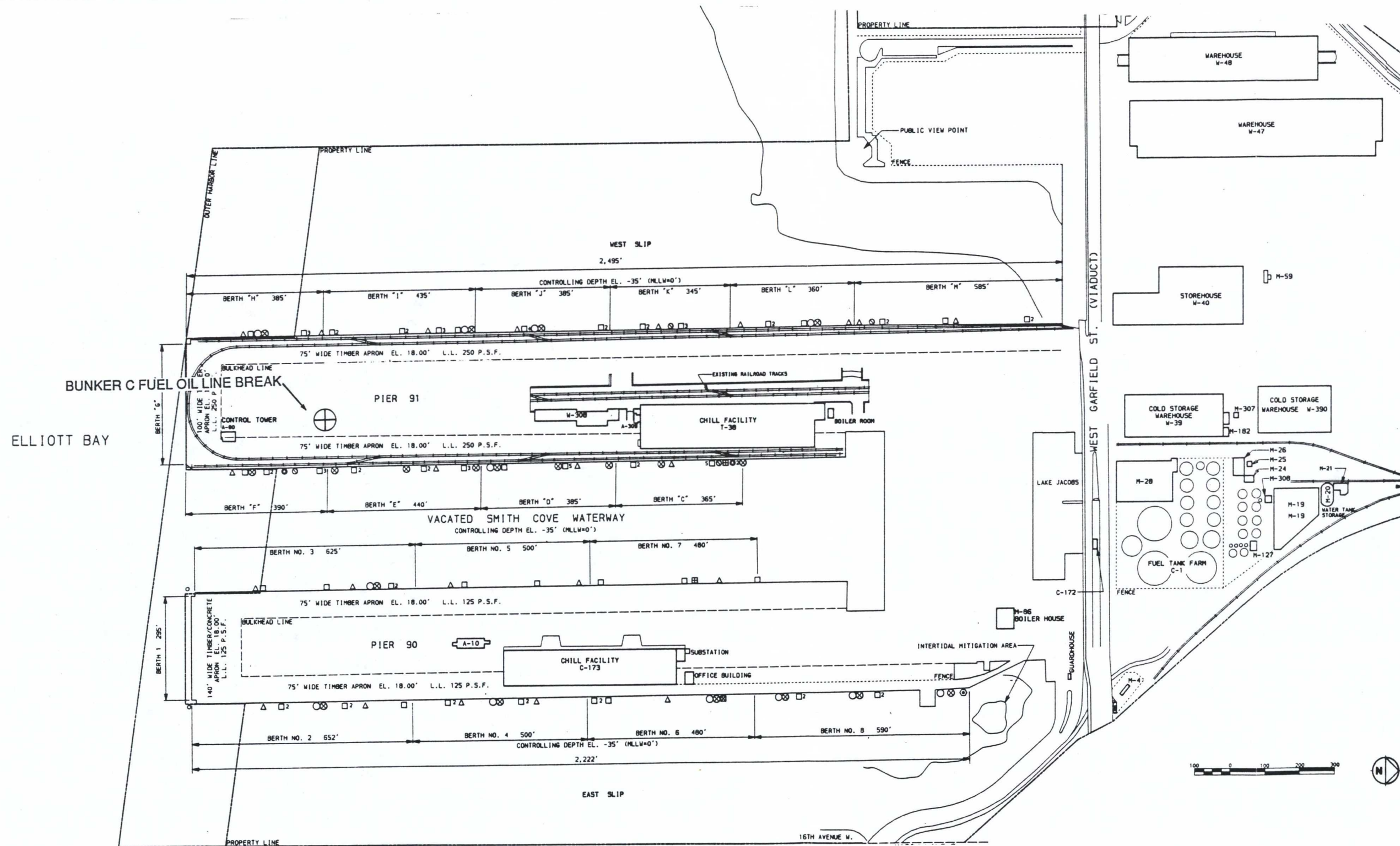
Project No.
91-35290

Figure No.



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SITE LAYOUT

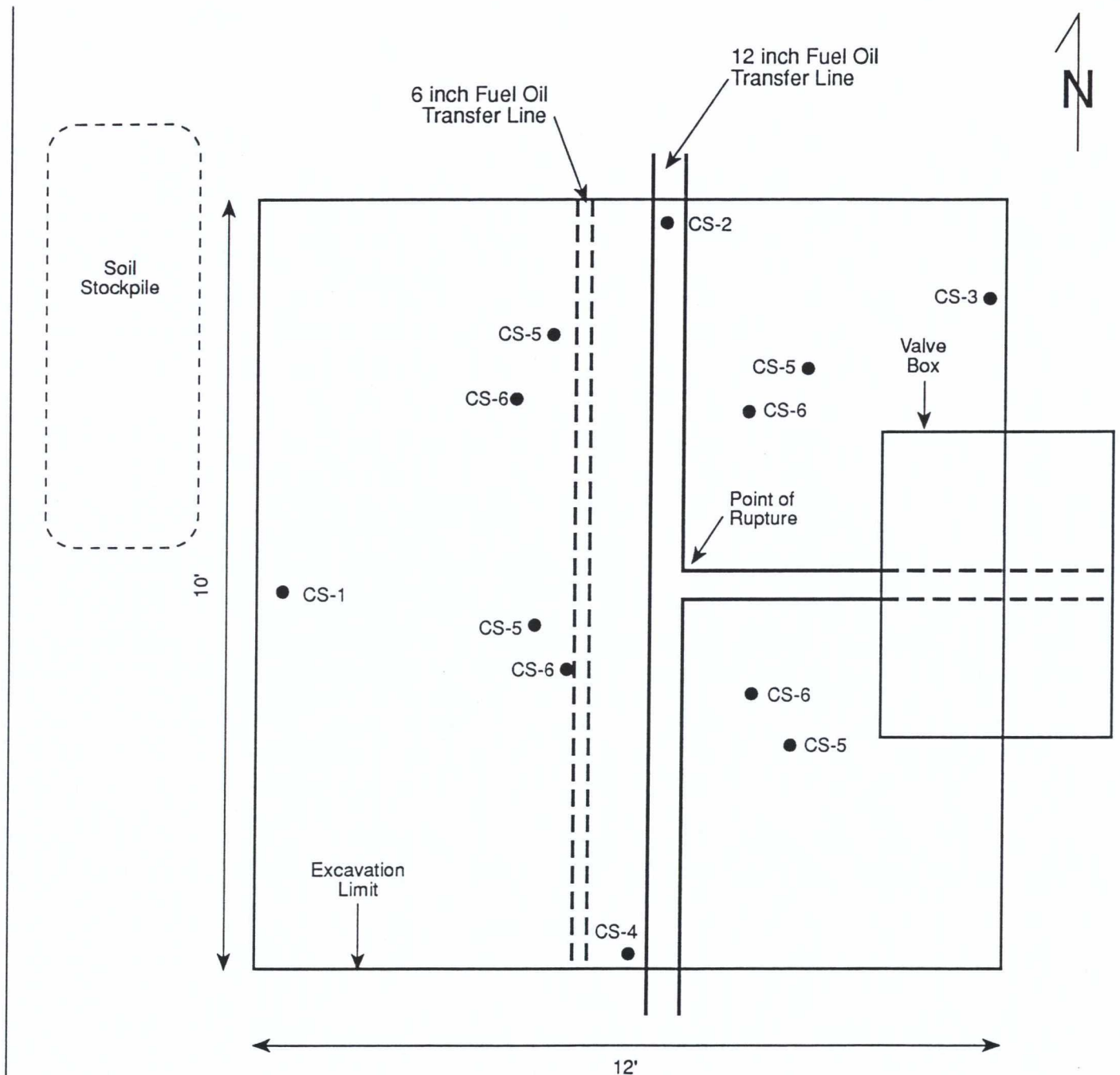
BUNKER C OIL LINE BREAK - TERMINAL 91
Seattle, Washington
for Pacific Northern Oil Company

Project No.
91-35290

Figure No.



Converse Consultants NW Geotechnical Engineering
and Applied Earth Sciences



SCHEMATIC ONLY
Not to Scale

EXCAVATION AND SITE SAMPLING PLAN

BUNKER C OIL LINE BREAK-TERMINAL 91
Seattle, Washington
for Pacific Northern Oil Company

Project No.

91-35290

Figure No.

3



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Appendix A

APPENDIX A

**LABORATORY-REPORTED ANALYTICAL TESTING RESULTS AND
CHAIN-OF-CUSTODY DOCUMENTATION**

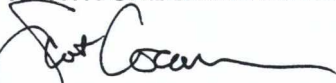
Converse Consultants, NW
18 W. Mercer, #300
Seattle, WA 98119
Attention: Rich LarsonClient Project ID: 91-35290-01
Matrix Descript: Soil
Analysis Method: EPA 418.1 Modified (I.R. w/clean-up)
First Sample #: 106-0584Sampled: Jun 14, 1991
Received: Jun 14, 1991
Extracted: Jun 15, 1991
Analyzed: Jun 15, 1991
Reported: Jun 17, 1991**TOTAL RECOVERABLE PETROLEUM HYDROCARBONS (WTPH-418.1)**

Sample Number	Sample Description	Petroleum Oil mg/kg (ppm)
106-0584	CS-1	N.D.
106-0585	CS-2	22
106-0586	CS-3	31
106-0587	CS-4	N.D.
106-0588	CS-5	300
BLK061591	Method Blank	N.D.

Detection Limits:

10

Analytes reported as N.D. were not present above the stated limit of detection.

NORTH CREEK ANALYTICALScot Cocanour
Laboratory Director

1060584.CON <2>

Converse Consultants, NW
18 W. Mercer, #300
Seattle, WA 98119
Attention: Rich LarsonClient Project ID: 91-35290-01
Matrix: Soil
Analysis for: Total Solids
First Sample #: 106-0584Sampled: Jun 14, 1991
Received: Jun 14, 1991
Analyzed: Jun 15, 1991
Reported: Jun 17, 1991**LABORATORY ANALYSIS FOR: Total Solids**

Sample Number	Sample Description	Sample Result %
106-0584	CS-1	94
106-0585	CS-2	96
106-0586	CS-3	98
106-0587	CS-4	98
106-0588	CS-5	92

North Creek Analytical routinely provides analytical results for soils, sediments or sludges in a wet weight "as received" basis.
To attain dry weight equivalents for regulatory compliance, divide the soil result by the decimal fraction of percent solids.

NORTH CREEK ANALYTICAL
Scot Cocanour
Laboratory Director

Converse Consultants, NW
18 W. Mercer, #300
Seattle, WA 98119
Attention: Rich Larson

Client Project ID: 91-35290-01
Method : EPA 418.1
Sample Matrix : Soil
Units : mg/kg
QC Sample #: 106-0584

Analyst : K. Stark

Extracted: Jun 15, 1991
Analyzed: Jun 15, 1991
Reported: Jun 17, 1991

QUALITY CONTROL DATA REPORT

ANALYTE	Petroleum Oil
---------	------------------

Sample Conc.: N.D.

Spike Conc.
Added: 505

Conc. Matrix
Spike: 400

Matrix Spike
% Recovery: 79

Conc. Matrix
Spike Dup.: 400

Matrix Spike
Duplicate
% Recovery: 79

Relative
% Difference: 0

NORTH CREEK ANALYTICAL

Scot Cocanour
Laboratory Director

% Recovery:	$\frac{\text{Conc. of M.S.} - \text{Conc. of Sample}}{\text{Spike Conc. Added}} \times 100$
Relative % Difference:	$\frac{\text{Conc. of M.S.} - \text{Conc. of M.S.D.}}{(\text{Conc. of M.S.} + \text{Conc. of M.S.D.}) / 2} \times 100$

Chain of Custody Record & Laboratory Analysis Request

Number of coolers:

Phone #:

Client Project ID: 91-35290-01

Client Project ID:					
Samplers:					
				No	

Notes/Comments

Lab ID

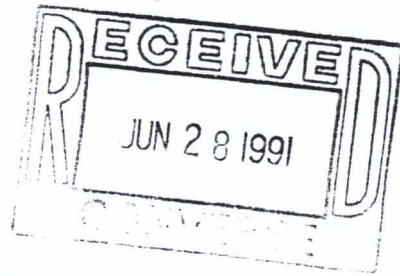
8

Time:

Time:

Time:

27 June 1991



**ANALYTICAL
RESOURCES
INCORPORATED**

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

Rich Larson
Converse Consultants
18 West Mercer Street, Suite 300
Seattle, WA 98119

**RE: Client Project: 91-35-290-01;
ARI Job #8524**

Dear Rich:

Please find enclosed the results for the above referenced project.

If you have any questions or require additional information, please feel free to call anytime.

Sincerely,

ANALYTICAL RESOURCES, INC.

Kate A. Stegemoeller
Project Coordinator

KAS/kp

Enclosures

cc: ARI file #8524



**ANALYTICAL
RESOURCES
INCORPORATED**

Analytical
Chemists &
Consultants

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

**TOTAL PETROLEUM HYDROCARBONS by IR Scan
Modified EPA Method 418.1**

Matrix: Soil

Project: 91-35-290-01

QC Report No: 8524 - Converse Cons.

VTSR: 06/24/91

Data Release Authorized

Data Prepared: 06/27/91 -MAC:PJW

Date Prepared: 06/24/91

Date of Analysis: 06/25/91

Lab ID	Client Sample ID	Dilution Factor	TPH (ppm)
8524 MB	METHOD BLANK	1	10 U
8524 A	CS-6-BASE	1	10 U

Values reported in ppm (mg/Kg) based on wet weight of sample

U Indicates compound was analyzed for but not detected at the given
detection limit.

Chain of Custody Record & Laboratory Analysis Request

Date: 6-24-91
 Page 1 of 1
 Number of coolers: 0



ANALYTICAL
RESOURCES
INCORPORATED

333 Ninth Ave. North
Seattle, WA 98109-5187
(206) 621-6490
(206) 621-7523 (FAX)

ARI Client: Converse Consultants NW Phone #: 285-5200

Client Contact: Rich Larson

Client Project ID: 9135-290-01

Samplers: R. Larson

	Sample ID	Date	Time	Matx	No Cont	Lab ID
1	CS-6 Base	6-24	1600	Soil	1	
2						
3						
4						
5						
6						
7						
8						

Analysis Required										Notes/Comments
4/8-1										
X										

Comments/Special Instructions:	Relinquished by: (Signature) <u>R. A. Larson</u>	Relinquished by: (Signature) <u>Homar F. Welborn</u>	Relinquished by: (Signature)
	Printed Name: <u>R. A. Larson</u>	Printed Name: <u>Homar F. Welborn</u>	Printed Name:
	Company: <u>CCNV</u>	Company: <u>Converse Consultants NW</u>	Company:
	Date: <u>6/24/91</u> Time: <u>16:05</u>	Date: <u>6-24-91</u> Time: <u>1605</u>	Date: Time:
	Received by: (Signature) <u>Erin Cranwill</u>	Received by: (Signature) <u>Erin Cranwill</u>	Received by: (Signature)
	Printed Name: <u>Erin F. Welborn</u>	Printed Name: <u>Erin Cranwill</u>	Printed Name:
	Company: <u>Converse Consultants</u>	Company: <u>A. R. I.</u>	Company:
	Date: <u>6-24-91</u> Time: <u>1605</u>	Date: <u>6/24/91</u> Time: <u>16:05</u>	Date: Time:

A D T H 8574

Appendix B



APPENDIX B

SOIL DISPOSAL MANIFEST AND WEIGHT VOUCHERS

CUSTOMER NUMBER
17585

INVOICE
GENERAL CONTRACTORS
WOODWORTH & COMPANY

GENERAL CONTRACTORS
1200 EAST D STREET
TACOMA, WASHINGTON 98421
Tacoma 383-3585 / Seattle Area 838-9090
"EQUAL OPPORTUNITY EMPLOYER"

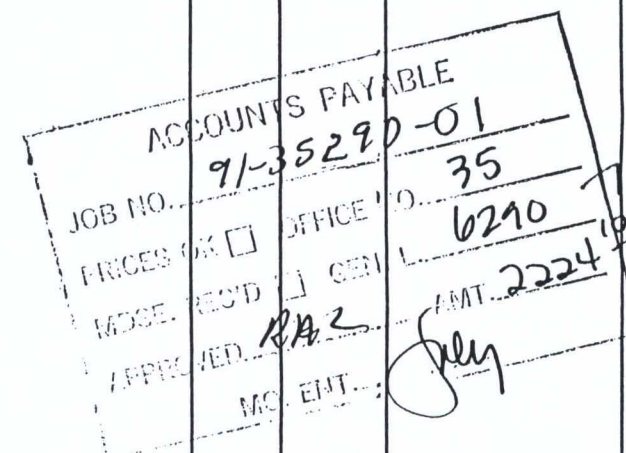


PAGE #	1
INVOICE DATE	6/28/91
INVOICE #	20609
ORDER #	9062
CUSTOMER P.O. #	

CONVERSE CONSULTANTS NW
18 WEST MERCER STREET
SUITE 300
SEATTLE WA 98119

PLEASE REFER TO INVOICE # 20609

JOB	DATE	ITEMS	QUANTITY	UNIT	PRICE	AMOUNT	TAX AREA	TAX RATE	TAX	TOTAL
		DISPOSAL OF CONTAMINATED SOIL FROM PACIFIC NORTH- ERN OIL - PIER 91 SEATTLE *****								
003619	6-25	QUANTITY	37.28	TON	50.00	1,864.00	SV00	.00%		1,864.00
003619	6-25	TRUCK TIME	5.00	HRS	72.02	360.10	WACC	.00%		360.10
		** INVOICE TOTALS **				2,224.10 *			.00 *	2,224.10 *



1939

CONTR. REG. 223-01-WO-OD-W-377NO

CUSTOMER

TERMS: NET DUE 30 DAYS FROM DATE OF INVOICE 1 1/2% PER MONTH
CHARGED ON PAST DUE ACCOUNTS. CUSTOMER AGREES TO PAY